

ABSTRACT

Title: The comparison of effects of therapy in multiple sclerosis patients using functional magnetic resonance imaging

Objectives: The aim is to find relation between changes of the brain activation (or effective connectivity) and the training of motor function in multiple sclerosis (through the analysis of fMRI data). These outputs were compared with outputs of healthy volunteers. Furthermore, the therapy that activates global motor response with therapy that activates mostly peripheral muscle response was compared.

Methods: A pilot experimental study. Twelve multiple sclerosis patients were divided into two groups and underwent physiotherapy program (one hour therapy twice a week). The stimuli were applied to evoke global motor reaction in the first group (Motor programs activating therapy). The aim in the second group was to evoke peripheral muscle reaction. The clinical and fMRI examination was carried out before and after therapy. FMRI results were compared with healthy controls.

Results: We found improvement in all examined clinical tests (irrespective of the therapy that the patients underwent). We found the decrease of the strength of effective connectivity after therapy in both groups. We did not trace significant difference between groups nor between patients and healthy controls in fMRI data.

Keywords: brain activation, brain plasticity, clinical tests, effective connectivity, motor programs activating therapy, motor response